

REMARKS

Claims 11, 19-26 and 29-32 are pending. Favorable reconsideration is respectfully requested.

As set forth in Claim 11, the present invention relates to an alkyl ether sulfate salt of the general formula I



where

R is an i-C₁₃ group,

R¹ is methyl,

M⁺ is a cation, selected from the group consisting of alkali metals, NH₄⁺ and HNR₃²⁺, where R² is selected from the group consisting of unbranched or branched alkyl radicals, CH₂CH₂OH and CH₂CH(OH)CH₃,

y has a mean value of 1-2,

z has a mean value of 1-4,

for which the quotient A of the critical micelle concentration cmc

$$A = \frac{\text{cmc } (\text{RO-(CH}_2\text{CH}_2\text{O)}_z\text{SO}_3^-\text{M}^+)}{\text{cmc } (\text{RO-(CH}_2\text{-CHR}^1\text{O)}_y\text{-(CH}_2\text{CH}_2\text{O)}_z\text{SO}_3^-\text{M}^+)} \text{ is } > 1.$$

The rejection of the claims under 35 U.S.C. §103(a) over Verdicchio et al. is respectfully traversed. The reference fails to suggest the claimed alkyl ether sulfate salt.

As described in the executed Rule 132 Declaration of Dr. Juergen Tropsch, an inventor of record in this application, submitted herewith, comparative examples were prepared which show that the sulfated ethers based on i-C₁₀-alcohol according to Verdicchio et al. are less effective as surfactants compared to the i-C₁₃-alcohol based sulfates according to the present invention, as discussed in detail below.

The ethersulfates based on i-C₁₀-alcohol according to Verdicchio et al. have been prepared according to the general protocol for sulfating alcohols/alcohol alkoxylates according to page 21, lines 6 to 17 of the English description of the present application.

Alkyl ether sulfates based on i-C₁₀-alcohols have been prepared using 3 equivalents of ethylene oxide (comparative example 1), 2 equivalents of propylene oxide followed by 2 equivalents of ethylene oxide (comparative example 2) and 2 equivalents of propylene oxide and 3 equivalents of ethylene oxide (comparative example 3). The critical micelle concentration (cmc) has been determined according to page 22, lines 1 and 2 of the description of the present application. The results of the comparative examples and of examples 4, 5 and 6 according to the table on page 21 of the description are shown in the following table:

Example	Alcohol	Amount PO [mol]	Amount EO [mol]	Cmc [mmol/l]
Comp. Ex. 1	i-C ₁₀	0	3	4.60
Comp. Ex. 2	i-C ₁₀	2	2	3.46
Comp. Ex. 3	i-C ₁₀	2	3	2.61
Example 4	i-C ₁₃	2	0	0.27
Example 5	i-C ₁₃	2	1	0.33
Example 6	i-C ₁₃	2	3	0.22

PO: propylene oxide

EO: ethylene oxide

cmc: critical micelle concentration

The alkyl ether sulfates according to Verdicchio et al. show high cmc of 4.60 mmol/l, 3.46 mmol/l and 2.61 mmol/l. In contrast, the inventive alkyl ether sulfates based on i-C13-alcohol show very low cmcs of 0.27 mmol/l (example 4), 0.33 mmol/l (example 5) or 0.22 mmol/l (example 6). In particular, example 6 being the inventive i-C13-alcohol propoxylated with 2 equivalents of propylene oxide followed by 3 equivalents of ethylene oxide shows a very low cmc of only 0.22 mmol/l, whereas directly comparable example 3, being the i-C10-alcohol according to Verdicchio et al., being alkoxylated with 2 equivalents of propylene oxide followed by 3 equivalents of ethylene oxide shows a high cmc of 2.61 mmol/l being about 12 times higher than the cmc of example 6 according to the present application. The Cmc values were determined according to page 22, lines 1 and 2 of the present specification.

The examples according to the present invention and the comparative examples which have been prepared as described herein clearly show that the difference in respect of the alcohol, i-C13 according to the present application versus i-C10-alcohol according to Verdicchio et al., shows an unexpected and surprising advantage. The cmc, which is a very important characteristic feature of a surfactant, can be decreased about 12 times.

Verdicchio et al. do not point in the direction that i-C13-alcohols forming the basis of alkyl ether sulfates make it possible to decrease the cmc of these compounds to 1/12 compared to the i-C13-alcohol. Therefore, substitution of i-C10 according to Verdicchio et al. by i-C13 according to the present application is not suggested to a person having ordinary skill in the art and also shows unexpected and significant advantages. The substitution of i-C10 according to Verdicchio et al. by i-C13 according to the present application would not have been not been obvious to a person having ordinary skill in the art. Accordingly, the subject matter of the pending claims is not obvious over this reference. Withdrawal of this ground of rejection is respectfully requested.

Applicants submit that the present application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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